

HARRY MEDOVY LECTURE IN SOCIAL PAEDIATRICS

"NORTHERN PAEDIATRICS"

Dr. J.A. Hildes

INTRODUCTION

I am painfully aware of my inadequacy as the eleventh Harry Medovy Lecturer, but it is not, my illustrious Canadian and American predecessors that make me feel that way; it is Harry Medovy himself. His achievements in social paediatrics make any efforts of mine appear modest indeed, if not downright puny. I want Dr. Medovy to know how honored I am to be delivering this lecture, but I must not dwell on that topic since I have had a clear message from the man himself to talk about social paediatrics and not about Harry Medovy.

The topic I have chosen is Northern Paediatrics since my paediatric experience, such as it is, largely stems from my position as Director of the Northern Medical Unit. I could try and stretch my credentials back to the polio days of the early 1950's when I received my first real paediatric teaching at the hands of Harry himself, ably assisted by Bruce Chown and Sid Israels; but I must confess that after a short, very busy and very exhilarating paediatric adventure into polio, I slid back into the darkness of adult gastroenterology for the next couple of decades before I again saw the paediatric light!

I became a born-again paediatrician when the Northern Medical Unit was put together in 1969. At that time a cadre of dedicated paediatricians was already serving northern Manitoba Indian communities - Besant, Briggs, Coodin, Kerr, Ferguson and Grewar. These and others formed the Manitoba

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contingent which in turn was part of the deep commitment of the Canadian Paediatric Society to native children. Mind you, although they were dedicated to the children, they did not confine themselves to treating little people when they travelled to northern settlements. They would treat adults as well at the drop of a hat. On more than one occasion that fine paediatrician, Charlie Ferguson, would team up with Don Rodgers, the shrink, and become a veritable travelling circus, treating all comers including emergency surgery and obstetrics.

This talk will not be a scientific treatise but rather a loose array of topics to illustrate my perspective of the present state of the health of northern native children. Please forgive me if I speak more about Inuit than Indians; it has just happened that way. I wish to acknowledge that I have drawn fully on the work of many colleagues; if I don't my plagiarisms will soon become obvious.

I will briefly sketch the "traditional" way of life of the autochthonous people before they were overrun by the Euro-Canadian culture - a little about child rearing, nutrition and housing. Then I will touch on factors impinging on paediatric health during the "transitional" period for northern natives when the dominant culture imposed a changing way of life from nomadic hunting to living in small isolated northern settlements. I will show the effects of these changes in lifestyles on fertility, infant mortality, and on selected paediatric illnesses, and note the secular changes in growth and development.

Moving into the present, all is not yet well with northern paediatric health in spite of our efforts, and considerable success in providing visits to paediatricians to northern communities and easy access to the health

facilities in Winnipeg and other large medical centres. We may need to take initiatives other than the treatment of paediatric disease, which we still find with a prevalence too high to be acceptable for Canadians.

TRADITION & TRANSITION

Traditionally the Inuit newborn was naked in his mother's amautik and had skin-to-skin contact with the mother who was sensitive to the child's every need. That was his home base not only during infancy but beyond it, until he was displaced by the next child. Infant feeding was breast milk. Lactation for women in the child-bearing age was sometimes virtually continuous from the first pregnancy to menopause. Not only was the new infant breast fed but the next older sibling, even at three or four, was still partial to mother's milk, and occasionally suckled. When a child was about six months old, solid food was added to his diet, often pre-chewed. This was usually seal, fish, or caribou.

The snow house is well known as the traditional dwelling for the central Arctic Inuit. I recall visiting a winter encampment on the Hudson's Bay coast in the spring of 1963 where an extended family of about 10 people lived in a big three room snow house partly drifted over. The men were dressed in caribou clothing and all their hunting gear was stored safely nearby. That was the home of a ten year old boy with tuberculosis; he was one case in an outbreak which occurred in the late 50's and early 60's in the caribou people. It was associated with the starvation of those years when the caribou failed to appear on their usual migration routes. In summer the Inuit shelter was a skin tent and in some areas a double insulated tent was used year round. The traditional shelter of northern Indians was also a skin tent.

The establishment of permanent settlements came about through the activities of the fur trade. Permanent settlements meant new problems - housing, water, sewage and garbage to name a few. There were no easy solutions to these problems. It may seem ridiculous to worry about water when the land is covered with it, and that is well and good for a small nomadic population; but once a permanent settlement is established the ground water around it soon becomes contaminated by garbage and human waste. Water and sewage treatment is difficult and expensive because of the nature of the terrain - bedrock and permafrost.

In the 50's in the Arctic and later in northern Manitoba governments developed housing projects to improve living conditions which were being blamed for a lot of the sickness such as tuberculosis, pneumonia, bronchitis, otitis media, infectious skin disease and diarrhea in infants and children.

The first type of government housing in the Arctic was a small frame and plywood shack, poorly insulated; one bedroom partly partitioned off, no plumbing, and heated by a fuel oil cookstove. Subsequently there were generations of improved housing with up to three bedrooms, a holding tank for water which was trucked in, a sink that emptied onto the ground beneath the house, but no toilets. Instead, honey buckets are used, lined with plastic bags which are supposed to be deposited in 40 gallon drums outside the house and picked up and taken by truck to a dump. But the honey bags often lay broken and frozen outside the door waiting for the spring thaw.

Where there was industrial development with proper town sites these problems were overcome at great costs. Nanisivik is a neat little town on Northern Baffin Island, the site of a rich ore body of lead and zinc

which is mined, crushed in the mill, concentrated, pelletized and stored in a large shed on the shore of Strathcona Sound to be taken out by ship to Europe during the few weeks of open water in the summer.

The mine may have solved the housing, the water and the sewage problems but other environmental and social problems have been created, such as environmental pollution and the introduction of adult health problems which have great impact on the health of children - the use of store food, and alcohol, working mothers, and jet service to Montreal three times a week.

The basic development in non-industrial northern Manitoba was quite a bit slower. North Knife Lake is such a development. It was intended as a permanent Indian settlement by the Churchill Band who were determined to move away from the conditions at Churchill which were decimating them with disease, violence and alcohol. They lived for a few years winter and summer in canvas tents while they were building log houses. Subsequently they moved again and established a community at Tadoule Lake but they are now finding that too inaccessible to the amenities and necessities of modern life. For many places access may still be only by float plane since the air strips in many northern communities are not yet well developed although they are being upgraded year by year.

HEALTH STATUS OF CHILDREN

✓ The importance of the influence of lactation on fertility has been disputed, but evidence bearing on this in Igloolik ten years ago is available¹ (Fig. 1). Those data show a direct relationship between lactation and fertility: women who nursed a child for two or three years had long intervals between pregnancies; but those who did not nurse at all became

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fertile and conceived within a few weeks of delivery. Igloolik, in Northern Foxe Basin is a rich area for hunting and fishing. Although the Hudson's Bay Co. had been established there for 35 years the people of the area had only left the camps and become urbanized in the 60's; and therefore young women had only recently abandoned breast feeding for the bottle and not all of them did so.

Schaefer and Metayer² used a piece of Inuit sculpture to illustrate the basis of the population explosion of the 1960's. The sculpture shows a woman with an infant in her amautik being further burdened down by an older child also clambering on her back. The older child is feeding the baby a bottle, a sure way to turn off lactation and so set the stage for yet another quick pregnancy - a further burden which cannot be managed and nurtured properly. The resulting phenomenal population growth occurred in the face of a rising infant mortality rate during the 1950's. Computed as a three year running average, the infant mortality, at 140 per 1000 live births in 1951, rose during the DEW line construction to peak at 240 in 1957. After that date it began to fall, associated with, and perhaps related to, the establishment of nursing stations and the development of air transportation which allowed rapid evacuation to hospital of very sick infants and children.

The decline in breast feeding is illustrated in Table I extracted from the Perinatal Infant Mortality and Morbidity Study Report by Spady and Schaefer³. Only 10% of Inuit, and under 5% of Indian and White infants born in 1973-74 were still being breast fed at six months of age.

Associated with these events, and with other circumstances of native people, there has been a good deal of paediatric illness. To illustrate

these I will draw anecdotally on our own experience and that of our colleagues but the following notes do not necessarily constitute a complete list nor are the conditions prioritized on some logical basis.

Chronic Otitis Media with tympanic membrane perforation was found by Brodovsky et al⁴ to affect 20 - 30% of Keewatin school children in the early 1970's. It also appears to be common although not quite so prevalent in northern Manitoba Indian communities as in the Keewatin, although the same systematic review of school children has not been undertaken. Schaefer⁵ had previously reported a protective effect of breast feeding on otitis media and a similar effect was found in the Northern Foxe Basin¹. However, the protective effect of breast feeding was not confirmed during infancy in the PIMM study of 1973-74³, nor in the followup of the Keewatin cohort of that study by Postl in 1980⁶.

Dental Caries is probably the most prevalent paediatric disease in northern natives and one which is clearly associated with the dietary aspects of cultural change and specifically with the introduction of refined CHO. This was well documented by Mayhall in both Canada and Alaska⁷. In many parts of the north neither the preventative or restorative programs have advanced to the point of counteracting the problem. An example of that are the findings on the Keewatin cohort of Inuit infants born in 1973-74 and studied by Postl in 1980⁶ which showed an average of six carious teeth per child only of which one was filled.

Lower Respiratory Tract Infections and Diarrheal Disease in Infancy - Sayed et al⁸ reporting on hospitalization for infectious diseases of infants from Cross Lake and Garden Hill in northern Manitoba found significantly more,

and more prolonged, hospital admissions in bottle-fed infants. The two common infectious causes of infantile hospital admissions were lower respiratory tract infections and diarrheal disease both of which were more frequent in bottle-fed infants.

Similar findings were reported by Schaefer et al⁹ in their study of two Arctic communities at different stages of acculturation but the findings in the 1980 Keewatin Study⁶ showed only a statistically significant protective effect of breast feeding on lower respiratory tract infections in infancy.

Meningitis - Wotton et al¹⁰ found bacterial meningitis to have a much higher incidence in the Keewatin District of the NWT than that reported for the U.S.A. The two most common causative organisms accounting for two thirds of the cases were H. influenzae, particularly in infants, and N. meningitides. Nicolle et al¹¹ subsequently carried out a study of nasopharyngeal carriage rates of these organisms and of circulating serum antibodies to them. The effect of short term (2 days) combined antibiotic prophylaxis sharply reduced the N. meningitides carriage rates which then remained low for several weeks. However prophylactic antibiotics had little effect on H. influenzae carriage rates. There is some hope for the development of a vaccine against the latter organism suitable for infants at risk.

Rheumatic Fever - Postl and Longstaffe¹² looked retrospectively at rheumatic fever in Manitoba Indian children over a decade and found the incidence to be three times as great in native people.

Hepatitis B - Gerry Minuk¹³ reported a high prevalence of hepatitis B markers particularly in older people at Baker Lake and similar findings have been reported from the ^{eastern} ~~western~~ Arctic¹⁴ and Alaska¹⁵.

Accidents & Violence - The prevalence in children of injury and death by fire, drowning, firearms, skidoo accidents, household accidents as well as parental neglect and aggression against infants and small children has been noted by Ferguson¹⁶. He and Wotton¹⁷ reported on the high rate of separation, morbidity and mortality of Inuit twins which illustrates the importance of cultural attitudes in paediatric care and also the fact that cultural attitudes may be modified.

Suicide - The rate of Inuit suicides in the NWT now exceeds the Canada rate and particularly so in young men and teenage boys¹⁸.

Eye Disease - A virtual epidemic of myopia has been reported in teenaged school children in the Inuit but no universally accepted explanation has yet been forthcoming¹⁹. The condition of phlyctenular keratoconjunctivitis leading to corneal scarring often in children²⁰ is no longer seen commonly in the acute stage.

MAIN
HEADING →

Renaissance of Breast Feeding - Recently there has been a significant and gratifying reversal of the secular trend to abandon breast feeding which has taken place not only in the south but even more so in northern native communities where the adverse effect of bottle feeding has been so great. Table II is from PIMM study data³ and indicates that more older Inuit and Indian mothers in 1973-74 breast fed their infants than did the younger mothers. However, a more recent study by the same principal authors²¹ shows a sharp reversal of that trend in only five years (Table III). Table IV shows hospitalization data from the same paper. The authors attribute the improvement in infant health, as indicated by a decreased need for hospitalization, to the more universal commitment of NWT mothers to breast feeding.

GROWTH & DEVELOPMENT

Schaefer²² has compared children of the Cumberland Sound examined by Dr. Orford, the resident physician in Pangnirtung in 1938, with his own measurements in the same population 30 years later. The stature of the children measured by Orford was far below the 5th percentile of the standard established by the National Centre for Health Statistics in the United States. On the other hand the weights of these 1938 boys were at the 50th percentile up to age 9; but from age 9 to 15 these weights fell from the 50th to the 5th percentile. They were short but heavy. This is the typical Inuit body build; muscular, but short limbed. When Schaefer measured children in the same population 30 years later their weight per age is almost the same as Orford's but their stature was 5 - 10 cm. taller in the one generation. The same phenomenon was seen for girls with regard to stature and weight; they were the same weight up to age ten, but 5% taller in the 30 year interval. Even then by 1968 they had just managed to achieve the 5th percentile for stature according to NCHS scales. Between ages 11 and 15 another interesting finding emerged. Menarche accelerated over that one generation from age 16 to 12 as demonstrated by the difference in timing of the pubertal growth spurt in these girls. Schaefer and Timmermans⁹ in 1979 showed that not only are there temporal differences but also regional ones associated with the timing and duration of acculturation, and in particular dietary change. Arctic Bay boys in 1976 were just about as heavy but much shorter than the Inuvik boys measured in 1977. But even the Arctic Bay late teenaged boys are appreciably taller than the preceding generation of Arctic Bay boys whose limited growth ^{achievement} potential can be seen in the short stature of current Arctic Bay adults.

There was also a difference of some 10 kilograms in adult weights between Inuvik men (75 kg.) compared to Arctic Bay men (65 kg.), but this difference was attributed to excess fat in the Inuvik males as indicated by skin folds. Similar differences were seen between the females of Arctic Bay and Inuvik.

The secular trend to taller and heavier children is also seen in the PIMM study followup by Postl in 1980⁶. The same characteristic of heavy for height persists; weight of both boys and girls age 2-5 years is near the 90th percentile on the NCHS scales, but in terms of stature they are only at the 10-35th percentile of those scales.

RECENT TRENDS IN INFANT MORTALITY

Figure 2 shows the trend in NWT infant mortality in the past two decades. In the Inuit there has been a dramatic fall during the 60's which may be attributed to improved obstetrics and infant care. The improvement since then has been less spectacular but consistent and may be due to a combination of increased awareness of infantile infectious disease and more rapid hospitalization and transportation. The Indian NWT infant mortality started off in the 60's better than the Inuit but has not improved. Perhaps the disruption of the Indian lifestyle and his declining socioeconomic conditions have a bearing.

In spite of improvements the 1980 statistics for the NWT show the infant mortality rate to be more than double that for Canada. Table V compares Canadian rates with NWT rates and with the 1980 rates reported by the Sioux Lookout Zone Director²³. All native rates are higher than for Canada: birth rates for the NWT are down to about 30 but this is still twice

the Canadian average, and post neonatal infant mortality is still about three times the Canadian average. The main causes of infant mortality in the NWT are prematurity, post neonatal infections of the lower respiratory tract, the gastrointestinal tract and the central nervous system, and congenital defects.

SUMMARY

In summary the present situation has been achieved by doing a good job of looking after the sick; and that must be continued relentlessly. However to catch up with the rest of the country we must improve the prevention of illness through nutrition, immunization, and safety in the home; we must improve environmental health conditions such as water, sewage, housing and garbage; there must be improvement in the socioeconomic conditions and lifestyle - smoking, alcohol, health education, family planning and the emergence of native health professionals; and there must be an increased awareness among the native people of individual and community responsibility for health. What has been achieved for breast feeding can be achieved in all of these areas.

I have experienced great personal satisfactions in my ten years with the Northern Medical Unit in witnessing the growing insight of young physicians to the social aspects of health and disease, without any diminution in their clinical skills or in the use of modern technologies for improved diagnosis and treatment of the ill child. And so at the end of this dissertation on northern paediatrics what is left to be said? Although the advances of the last 25 years have been considerable, the challenge is still there and must be met. However, the physicians and other health professionals who are willing and capable of doing that job are coming on stage, and so the future is bright.

TABLE 1

DECLINE IN BREAST FEEDING

	1 MONTH	3 MONTHS	6 MONTHS	11 MONTHS
INUIT	36.7%	19.9%	10.9%	7.4%
INDIAN	17.2%	9.4%	4.4%	1.5%
WHITE	28.5%	11.9%	4.8%	2.3%

BREAST FEEDING AND MATERNAL AGE

% MOTHERS WHO BREAST FED

MATERNAL AGE	< 19	20-30	31+
INUIT	53	61	71
INDIAN	25	22	53

From NWT P.I.M.M. Study, 1973-74

TABLE III

5 YEAR INCREASE IN BREAST FEEDING N.W.T.

AGE IN MONTHS	PERCENT BREAST FED			
	INUIT		INDIAN	
	73-74	78-79	73-74	78-79
1	48	67	20	42
3	32	58	12	33
6	21	44	5	19
9	18	37	4	13
12	13	33	3	7

Schaefer & Spady, 1981

TABLE IV

5 YEAR DECREASE IN INFANT HOSPITALIZATION N.W.T.

	INUIT		INDIAN	
	<u>% HOSP.</u>	<u>HOSP. DAYS</u>	<u>% HOSP.</u>	<u>HOSP. DAYS</u>
1973-74	49	12.5	59	13.7
1978-79	25	7.3	53	16.8

Schaefer & Spady, 1981

TABLE V

BIRTH RATES & INFANT MORTALITY RATES

RATES	CANADA 1976	NWT - 1977-79			1980 S.L.Z.*
		ALL	INUIT	INDIAN	
BIRTH (PER 1000 POP.)	15.7	27.5	33.1	23.5	30.1
INFANT MORTALITY (PER 1000 LIVE BIRTHS)	13.5	28.5	32.6	47.1	26.5
NEONATAL MORTALITY (PER 1000 LIVE BIRTHS)	9.1	15.0	16.7	24.7	11.7
POST NEONATAL MORTALITY (PER 1000 LIVE BIRTHS)	4.3	13.6	16.0	22.5	20.6

* Sioux Lookout Zone

Figure 1

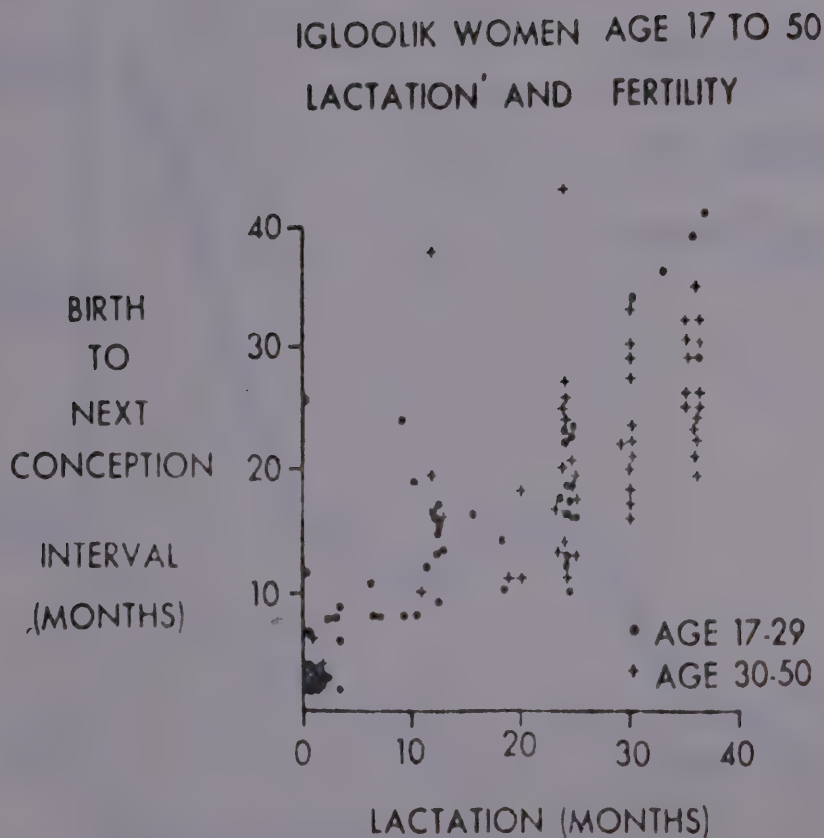
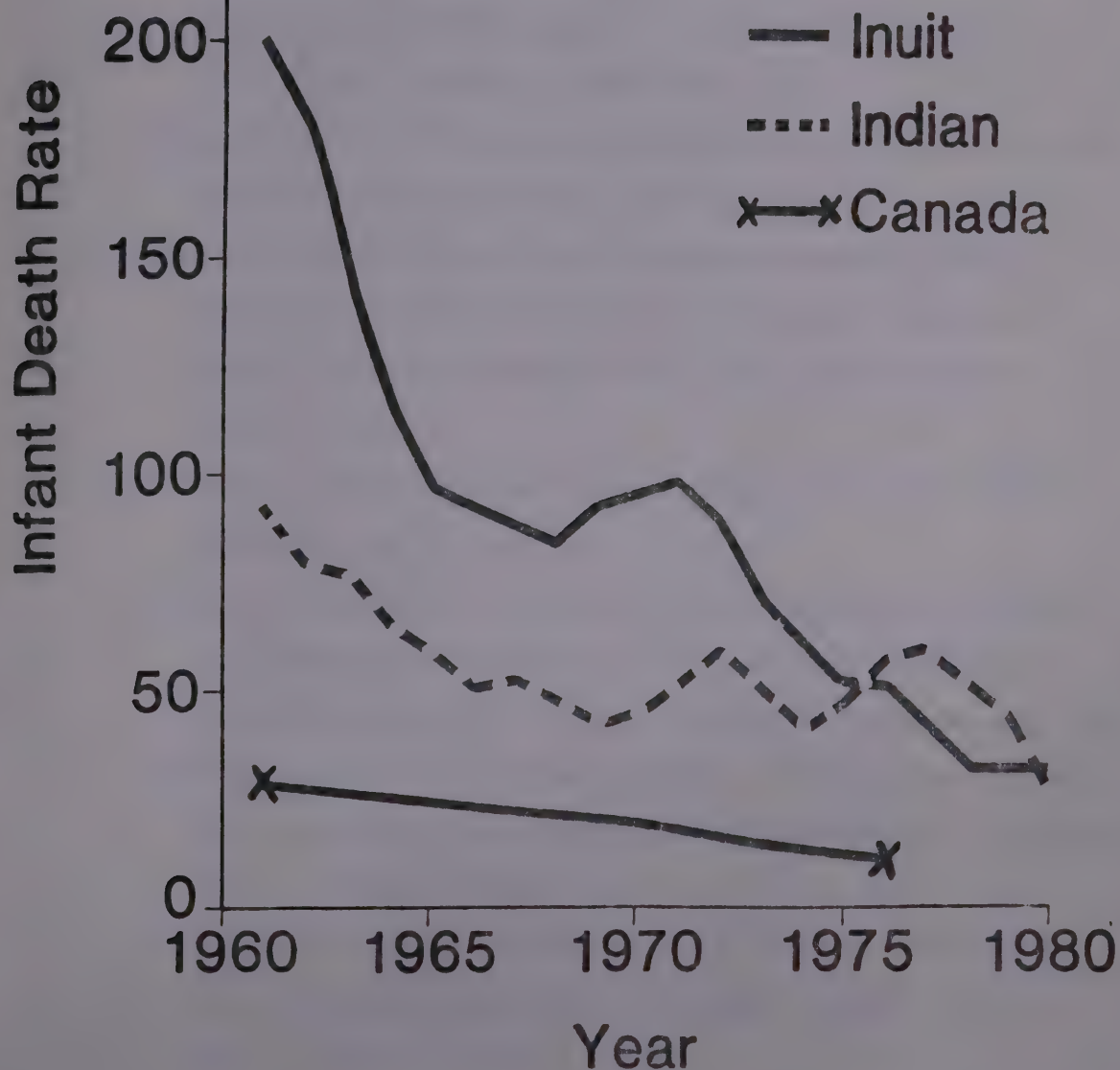


Figure 1. Igloolik women age 17 to 50.

Infant Mortality Rates N.W.T.

per 1000 live births
3 year running averages



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